

WHAT IS CLAIMED IS:

1. An ink jet print head, comprising:
 - a cavity plate that includes a plurality of nozzles and a plurality of pressure chambers communicating with the respective nozzles;
 - a plate-like piezoelectric actuator formed into a single laminated structure by laminating a plurality of piezoelectric sheets including a plurality of electrodes which are formed at positions so as to be aligned with the respective pressure chambers, the laminated piezoelectric actuator sintered and bonded to the cavity plate so as to close the pressure chambers provided in the cavity plate;
 - surface electrodes provided at an end portion of a surface of the piezoelectric actuator, which is opposed to a surface to be bonded to the cavity plate, and electrically connected with the plurality of electrodes; and
 - protrusions that each has a thickness of the surface electrodes and is provided on the surface of the piezoelectric actuator where the surface electrodes are provided.
2. The ink jet print head according to claim 1, wherein the plurality of pressure chambers are aligned in a number of rows, the surface electrodes connected with the electrodes are aligned in a number of rows at both end portions along the rows of the pressure chambers, and the protrusions are disposed between the rows of the surface electrodes.
3. The ink jet print head according to claim 2, wherein the cavity plate has beams to separate the adjacent pressure chambers, and the protrusions are provided on the surface of the piezoelectric actuator with respect to the beams.
4. The ink jet print head according to claim 3, wherein the surface electrodes and the protrusions are printed on the surface of the piezoelectric actuator using the same material.
5. The ink jet print head according to claim 4, wherein each of the piezoelectric sheets has a thickness of between 15-30 μm .
6. The ink jet print head according to claim 4, wherein each of the piezoelectric sheets has a thickness of between 22.5-30 μm .
7. The ink jet print head according to claim 5, wherein the electrodes are driving electrodes, which are formed at positions with respect to the pressure chambers, and common electrodes, which are formed at a position to cover the pressure chambers, wherein each of

the driving electrodes has a width of between 50-500 μm and a thickness of between 0.7-5 μm .

8. The ink jet print head according to claim 7, wherein each of the driving electrodes has a width of between 80-200 μm and a thickness of between 1-3 μm .

9. The ink jet print head according to claim 1, wherein the piezoelectric actuator has a flatness of 30 μm or less, which is a difference of height between projections and depressions formed on the piezoelectric actuator at its surface to which the cavity plate is bonded.

10. The ink jet print head according to claim 9, wherein the flatness is 30 μm or less in an area of 5 mm^2 .

11. The ink jet print head according to claim 8, the piezoelectric actuator has the flatness of 30 μm or less in an area of 5 mm^2 .

12. A method of fabricating an ink jet print head, comprising the steps of:

forming a cavity plate by laminating a plate, in which a plurality of nozzles are provided, and a plurality of plates, in which a plurality of pressure chambers communicating with the respective nozzles are provided;

forming a plate-like piezoelectric actuator by laminating a plurality of piezoelectric sheets, on each of which a plurality of driving electrodes are formed at positions with respect to the pressure chambers, and a plurality of piezoelectric sheets, on each of which a common electrode is formed at a position to cover the pressure chambers;

providing surface electrodes, which electrically connect one of the driving electrodes and the common electrodes, at both end portions of a surface of the piezoelectric actuator, which is opposed to a surface to be bonded to the cavity plate;

providing protrusions having a thickness of the surface electrodes, between the surface electrodes on the surface of the piezoelectric actuator;

forming the piezoelectric actuator into a single piece by sintering the piezoelectric actuator; and

bonding the piezoelectric actuator to the cavity plate so as to close the pressure chambers in the cavity plate while pressing both the surface electrodes and the protrusions using a jig having a flat surface.

13. The method of fabricating the ink jet head according to claim 12, wherein the surface electrodes and the protrusions are printed on the surface of the piezoelectric actuator at the same time using the same material.

14. The method of fabricating the ink jet print head according to claim 13, wherein each of the piezoelectric sheets has a thickness of between 15-30 μm .

15. The method of fabricating the ink jet print head according to claim 14, wherein each of the driving electrodes has a width of between 50-500 μm and a thickness of between 0.7-5 μm .

16. The method of fabricating the ink jet print head according to claim 14, wherein each of the driving electrodes has a width of between 80-200 μm and a thickness of between 1-3 μm .